III.C.1 Correlations Between Calculation and Experiment

The primary means of producing the data in this section, as in previous homogeneous solution sections, has been with the combination of the GAMTEC II and HFN computer codes. GAMTEC II was used to produce 18 energy group cross section sets which were then used in HFN to calculate critical sizes. A number of critical experiments were checked to verify the adequacy of the calculations. These are shown below:

	Geom.	Reflector	Solution	^{233}Ug/l	Calc. k_{eff}	Remarks
1.	Sphere[a]	Water	UO_2F_2	39	1.0257	31.9 cm .dia.
2.	Sphere[a]	Water	$UO_2(NO_3)_2$	62	1.012	26.6 cm .dia.
2a.	Same as 2				1.011 ±.010	KENO Calc.[c]
3.	Sphere[b]	Bare	$UO_2(NO_3)_2$	16.8	1.0070	70.5 cm .dia.
4.	Cyl.[a]	Bare	UO_2F_2	165	1.007	25.5 cm .dia.
5.	Cyl.[a]	Water	$UO_2(NO_3)_2$	49	1.015	25.5 cm .dia. h = 25.5 cm.
6.	Cyl.[a]	Paraffin	$UO_2(NO_3)_2$	336	1.074	19.1 cm .dia. h = 16.2 cm.
7.	Cyl.[a]	Paraffin	$UO_2(NO_3)_2$	336	1.018	15.1 cm .dia. h = 29.0 cm.
8.	Cyl.[a]	Paraffin	$UO_2(NO_3)_2$	275	0.995 ±.013	KENO Calc.[c]

The calculations performed generally indicate a slight conservatism in the calculational method. The high bias on 6 is at least partly due to the fact that the upper reflector was a significant distance from the top of the solution instead of immediately adjacent as assumed in the calculation.

A number of experiments have been performed in France; correlations with these experiments have not yet been attempted.

[a] Data from ORNL-2143, "Critical Mass Studies, Part VIII, Aqueous Solutions of ^{233}U", J. K. Fox, et al. Vessels were aluminum, coated with a corrosion inhibitor.

[b] See VI.2-1

[c] Used 16-group Hansen-Roach cross sections.